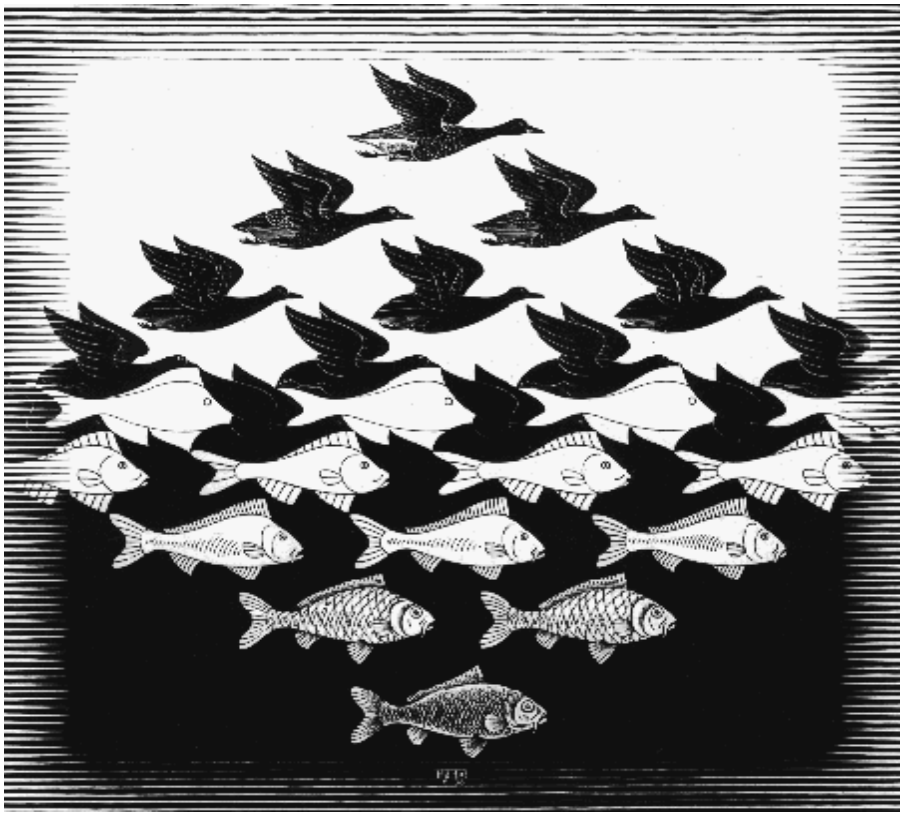
The Southern California Conversion Technology Demonstration Project

Presentation to the Southern California Waste Management Forum, May 10, 2007



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Overview

- What are Conversion Technologies?
- Conversion Technology Benefits
- The Southern California Conversion Technology Demonstration Project
- Reference Facility Tours
- Progress and Next Steps

Drivers for Change

- In the midst of a **Green Revolution**
- Driven by:
  - **Crises**
    - Energy
    - Fuel
    - Climate Change
    - Waste Management
    - Pollution
  - **Consciousness**
    - Conservation
    - Sustainability
    - Stewardship
    - Community

What are Conversion Technologies?

- Conversion Technologies are an array of emerging technologies capable of converting post-recycling residual solid waste into useful products and chemicals, green fuels like ethanol and biodiesel, and clean, renewable energy

What are Conversion Technologies?

- These technologies may be thermal, chemical, or biological
- Conversion technologies are not incinerators – there's no combustion of MSW
- Some examples of conversion technologies include pyrolysis, gasification, acid hydrolysis, thermal depolymerization, and anaerobic digestion
- Conversion technologies are successfully used to manage MSW throughout Europe and Japan, but commercial developments in the U.S. are still in design stage

Benefits of Conversion Technologies

- Ability to manage the excess biomass and organic wastes (up to 80% of landfilled material in California is organic)
- Reduce dependence on landfills and waste exporting, maintaining local control over disposal
- Ability to locally produce renewable energy and green fuels, including ethanol, biodiesel, electricity, etc.
- Promotes energy independence from foreign oil

Benefits of Conversion Technologies

- Conversion technologies turn a liability (solid waste) into a valuable resource
- Create high quality “green collar” jobs
- Reduce greenhouse gas emissions from disposal and transportation avoidance as well as fuel/electricity offsets
- Conversion products *may* include:
  - Electricity
  - Fuel (for example ethanol or biodiesel)
  - Chemicals (for example, liquid fertilizer)
  - Char (solid carbon)
  - Slag (inert fill or aggregate material)
  - Compost

Development Hurdles in California

- Cost
  - Most new CT plants have a large start up cost
  - Landfill disposal is (currently) relatively cheap
- Regulatory Hurdles
  - Currently only incineration or composting technologies are regulated
  - CT is a transitional technology and has no clear permitting or regulatory pathway
- Misconceptions
  - Perception of CT as similar to incineration
  - Perception that facilities will emit high levels of toxic emissions (esp. dioxins/furans)

Overcoming Hurdles in L.A. County

- Los Angeles County Board of Supervisors have promoted alternatives to landfills since 1997
- Simultaneous strategy to seek legislative remedies while promoting development of conversion technology facilities in California, in order to create a frame of reference on which future decisions can be based
- To further this goal, L.A. County formed a conversion technology task force, comprised of government officials, consultants, regulators, all experts in the field of conversion technology

Southern California Demonstration Project

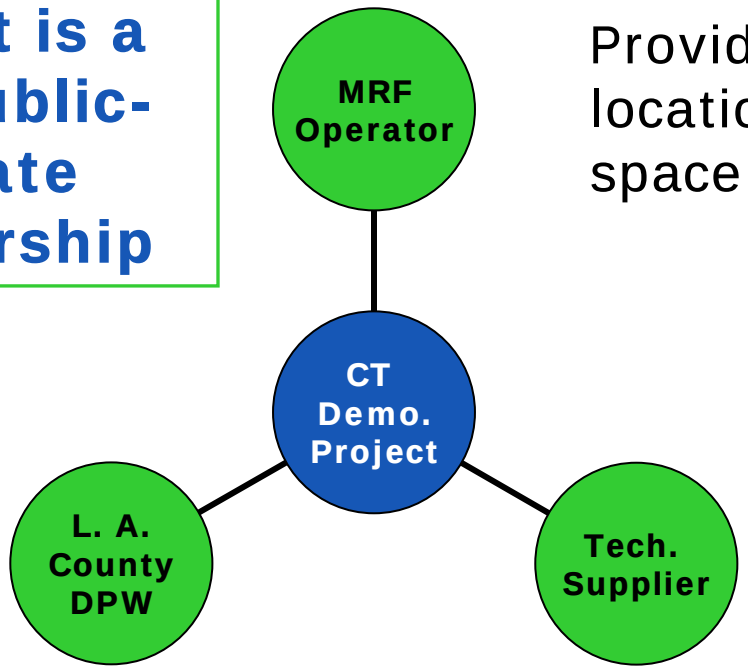
- On Aug. 18, 2005, this Task Force adopted the *Conversion Technology Evaluation Report*, which evaluated hundreds of technologies
- The *Report* detailed a step-by-step plan to develop a **Conversion Technology Demonstration Facility**, which could:
  - validate the technical, environmental, and economic feasibility of conversion technologies
  - Provide a showcase for interested parties
  - Yield tangible support data for future development
- The Report recommended co-locating the facility with a materials recovery facility (MRF)

Southern California Demonstration Project

- MRF co-location would have numerous benefits, including:
  - Land for development
  - Readily available feedstock
  - Pre-processing capacity
  - Appropriate zoning
  - Environmental benefits
  - Feedstock is material that would otherwise have been disposed
  - Transportation avoidance

Southern California Demonstration Project

Project is a true Public-Private Partnership



Provide feedstock and location with adequate space for technology

Facilitate partnering & permitting

Obtain operational data for future support of CT facilities

Procure supplemental grant funds

Provide technology for demonstration facility

Finance construction, B/O/O facility (as negotiated with MRF)

Southern California Demonstration Project

- The County's portion of the funding comes from:
  - Conditions placed on Landfill Permits in County unincorporated areas
  - Solid Waste Management Fee (landfill tipping fee on each ton of waste disposed by L.A. County Jurisdictions)
  - Since 1999, the County has spent approximately $4 million on a variety of efforts to evaluate and promote conversion technologies
  - This partnership allows the County to leverage relatively limited funds in order facilitate development of the demonstration project

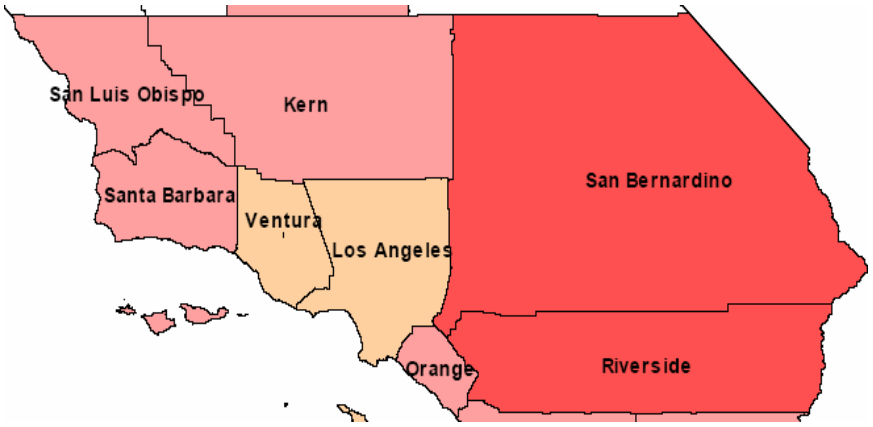
Southern California Demonstration Project

Currently there are **five** conversion technology suppliers being considered for the final demonstration project.

Vendor	Technology Type
Arrow Ecology	Anaerobic Digestion
Changing World Technologies	Thermal Depolymerization
International Environmental Solutions	Pyrolysis
Interstate Waste Technologies	Pyrolysis/ Gasification
Ntech Environmental	Gasification

Southern California Demonstration Project

There are also **five** Material Recovery Facilities (MRF) under consideration for partnership with the chosen technology supplier.



MRF	Location
Community Recycling/Resource Recovery, Inc. MRF	Los Angeles County
Del Norte Regional Recycling and Transfer Station	Ventura County
Perris MRF/Transfer Station	Riverside County
Rainbow Disposal Co., Inc. MRF	Orange County
Robert A. Nelson Transfer Station and MRF (RANT)	Riverside County

Southern California Demonstration Project

- 4 of the 5 MRF's under consideration are outside of Los Angeles County.
- This demonstration project included other counties in an effort to promote information exchange and the development of conversion technologies throughout the region.
- A major objective of this project is to forge permitting and legislative pathways for future projects.
- This project will provide a catalyst for private sector investment, especially by validating the technologies and reducing development risk *(bridging the "Valley of Death")*.

Progress and Next Steps – Contracts

Issue two concurrent contracts:

1. Facilitation contract
   - Match best conversion technology vendors/types and MRFs based on detailed financial, technical, and regulatory considerations
   - Approved by the Los Angeles County Board of Supervisors on July 5, 2006
2. Public Outreach contract
   - Develop and implement a general public outreach campaign aimed at increasing public awareness and understanding of conversion technologies
   - Solicit/incorporate community input for the demonstration facility
   - Approved by the Los Angeles County Board of Supervisors January 30, 2007

Reference Facility Tours

- Requirement of participation in the County's process was to have an operating reference facility:
  - pilot scale or larger
  - utilizing MSW or closely related feedstock
  - proven track record of operation
- Visiting and evaluating these reference facilities is a critical due diligence step and provides a greater level of confidence for all parties

Reference Facility Tours

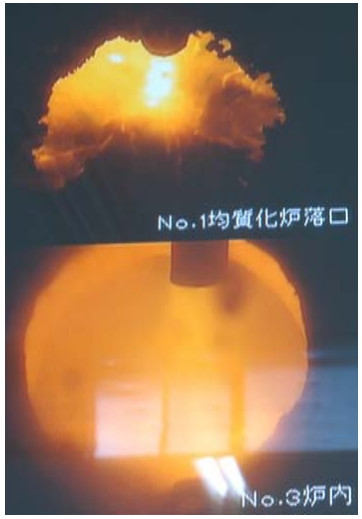



Site visits allowed us to compare waste streams…

Reference Facility Tours

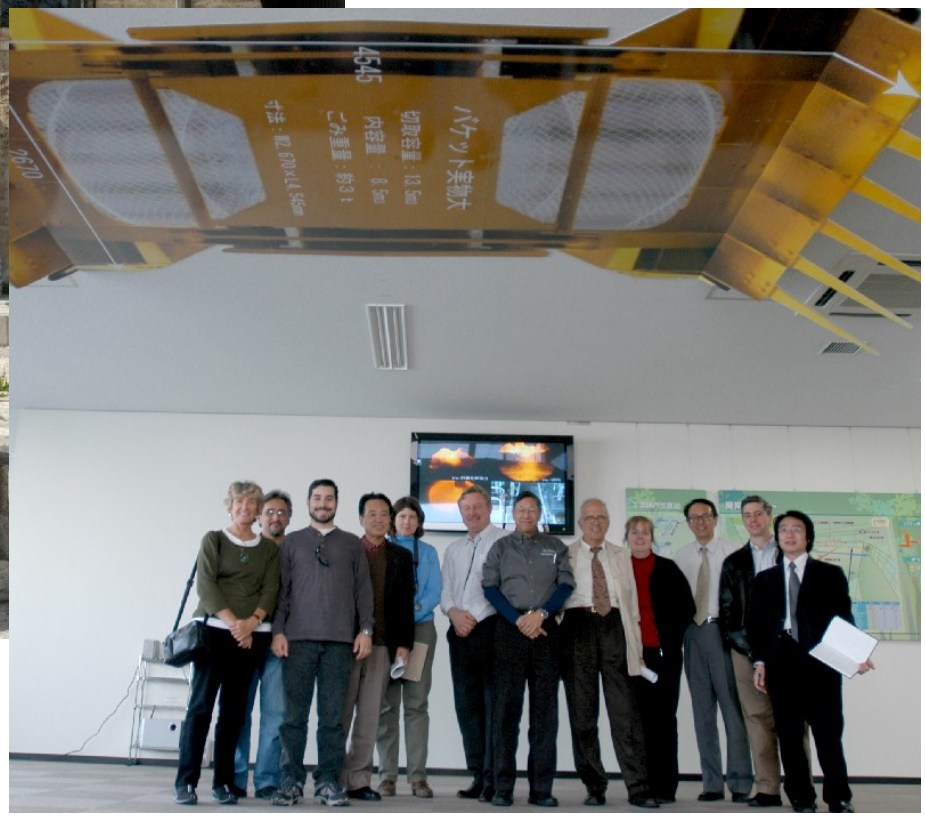
...evaluate products and byproducts...

Reference Facility Tours



...assess applicability and interface issues...

Reference Facility Tours



...and meet with local regulators and other stakeholders.

Reference Facility Tours – Lessons Learned

We learned a lot about other cultures and regulatory/political environments.
For example:

- **Japanese cultural discipline and recycling program regimen yields high participation and low contamination rates, incomparable to U.S.**
- **High disposal costs and landfill taxes of $50/ton drive innovation and promote alternatives**
- **Head-to-head comparison of mass-burn combustion and thermal conversion technologies highlights advantages of conversion**
  - emissions
  - ash or slag handling
  - flexibility of end product

Reference Facility Tours

...and we learned how the facilities were operated overseas.

Reference Facility Tours – Value

First hand visits provide a wealth of tangible benefits to a project and are a crucial step prior to development of a full scale facility.

Benefits include:

- Independent verification of technology
- Assessment of regulatory/policy differences
- Feedstock composition and pre-processing evaluation
- Direct meetings with regulators, community members and other stakeholders

Progress and Next Steps

- June 2007 – Complete final evaluation report for demonstration facility.
- July 2007 – Negotiations for MRF/technology supplier commence.
- Pursue funding mechanisms and facilitate construction of the demonstration facility.
- Ground breaking on construction of facility *optimistically* as soon as late 2008.

Summary

The Southern California Conversion Technology Demonstration Project creates a ripple of Regional benefits:

- Concrete performance data for various technologies with respect to emissions, byproducts and marketability of products
- A rigorous analysis of the **technical, economic,** and **environmental** feasibility of these technologies
- A permitting pathway and clear market signals for the private sector
- Impetus for development of conversion technologies throughout the region

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For copies of the
County's Evaluation Report, visit:
www.SoCalConversion.org

- **Sign up for future updates, including data and findings from our demonstration project, on our e-Notify system, linked from the website above.**